existed which was directing its actions. Furthermore, during the time in which this remarkable behavior was taking place the hermit crab, although at other times reacting quickly to movements outside of the aquarium, showed almost no reaction to the stimuli which are ordinarily produced by people passing or moving in front of the aquarium. This account describes a single series of observations but several other series were made in which the behavior was similar.

It seems probable that the anemones become associated with the hermit crabs very early in life, and that possibly they become attached in larval life to mollusc shells inhabited by hermits.

While the anemones are undoubtedly benefited by their association with the hermit crabs since the latter lead a wandering life in heavy growths of eel grass which harbor many small organisms, and while they may often take morsels from decaying animals upon which the hermits feed, the writer has never seen the hermits transfer pieces of food to the sea anemones as has been described by one investigator.

In the absence of any experimental work on these animals it cannot be proved that the sea anemone affords any protection for the hermit but it seems probable that stinging cells of the former would prevent the hermits being eaten by fishes.

We cannot believe that the hermit crab during its life time has learned by experience that it derives any advantage from transplanting the sea anemone although we know that crabs in general do profit by experience, and yet assuming that the remarkable behavior of the hermit is due to instinct, that is, to an "inherited combination of reflexes" which have been so brought together by the nervous system that the behavior has become fixed and adaptive in the species, it is extremely difficult to conceive how it has come about.

SPECTRA OF EXPLOSIONS

By J. A. Anderson

Mount Wilson Observatory, Carnegie Institution of Washington

Communicated by G. E. Hale, December 2, 1919

Some experiments with explosions of fine, iron wires by electrical means have led to the development of a method of producing a brilliant continuous spectrum extending throughout the visible spectrum and as far into the ultra-violet as can be recorded by a quartz spectrograph. On the continuous background appear as absorption lines practically all the iron lines usually found in the arc. For example, in the green region between $\lambda 5150$ and $\lambda 5700$, which is unfavorable for reversals in general, this spectrum on a scale of $6A$ per millimeter shows 128 absorption lines due to iron; Burns' table for the same region contains 215 lines, and

Rowland gives 180 lines of intensity 1 or higher, as due to iron. Both of these are from spectrograms having a scale of 1*A* per millimeter.

The apparatus employed consists of a small 25,000 volt transformer with a mechanical rectifier to charge a glass plate condenser of 0.4 microfarad capacity. The condenser is discharged through a circuit consisting of a spark gap 2 cm. long, in series with which is a fine iron wire 5 cm. long and weighing about 2 mg. When the condenser discharges the wire explodes with a loud report and a brilliant flash of light, and if it is enclosed in a tube of wood having an internal diameter of 1 cm. or less, the continuous spectrum is observed on viewing the tube, end on. The average duration of the explosion is of the order of 10^{-5} seconds, and ten explosions are sufficient to record a fully exposed spectrum of the λ4000 region, using a grating spectrograph giving a dispersion of 6*A* per millimeter. An exposure to the sun in this region requires $^1/_{40}$ second, from which it follows that this new source of light is of the order of 100 times as bright as the sun. With a quartz spectrograph the ultra-violet region at λ2300 (scale 4*A* per millimeter) is well recorded with 10 explosions, and the region at λ3500 (scale 20*A* per millimeter) with 1 or 2 explosions.

A few trial exposures have been made using nickel, copper, and manganin wires. These indicate that with nickel, the spectrum is considerably brighter than with iron, while with copper it is much weaker. Manganin and iron give about the same intensity.

With a larger condenser and higher voltage it is hoped that the brightness may be materially increased.

REPORT OF THE AUTUMN MEETING

PREPARED BY THE HOME SECRETARY

The Autumn Meeting of the Academy was held at Yale University, New Haven, Ct., on November 10 and 11, 1919.

Fifty-six members were in attendance, as follows: Messrs. C. G. Abbot, Bailey, Benedict, Boltwood, Bumstead, Cannon, Cattell, Chittenden, Cross, Cushing, Dana, Davenport, Davis, Day, Donaldson, Elkin, Flexner, Gomberg, Gooch, E. H. Hall, Harrison, Hastings, Henderson, Howard, Jennings, Johnson, Kasner, Leuschner, Lusk, Lyman, Mayor, Meltzer, Mendel, C. E. Mendenhall, Millikan, E. S. Morse, E. F. Nichols, A. A. Noyes, H. F. Osborn, T. B. Osborne, Parker, Pearl, Prudden, Russell, Schuchert, Setchell, Squier, Stratton, A. Trowbridge, Verrill, Walcott, Webster, H. S. White, Edmund B. Wilson, Edwin B. Wilson, R. W. Wood.

BUSINESS SESSIONS

The President announced the deaths of W. G. Farlow, elected to membership in the Academy in 1879; Joseph Barrell, elected in 1919; Lord Ray-